



REVIT PURE PRESENTS
PAMPHLETS



ISSUE #26 / FALL 2022

GROUPS

PART 2



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PAMPHLETS COLLECTION



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WHAT IS THIS “PAMPHLET”?

Revit Pure Pamphlets are published 4 times a year by email. Each edition covers a particular Revit theme. We like to pick themes that are complex and confusing. Our job is to make these topics simple for you.

WHY TALK ABOUT GROUPS?

In the last issue of PAMPHLETS, you learned the best practices to use Revit groups for multifamily housing projects. [Click here](#) to read the previous issue.

In this edition, we dive deeper and talk about the difference between groups, assemblies, links and nested families.

Then, you will learn how to use Dynamo to automate groups filtering.

You will also harness the power of Dynamo to automate the creation of views for each group.

Thanks and good luck!

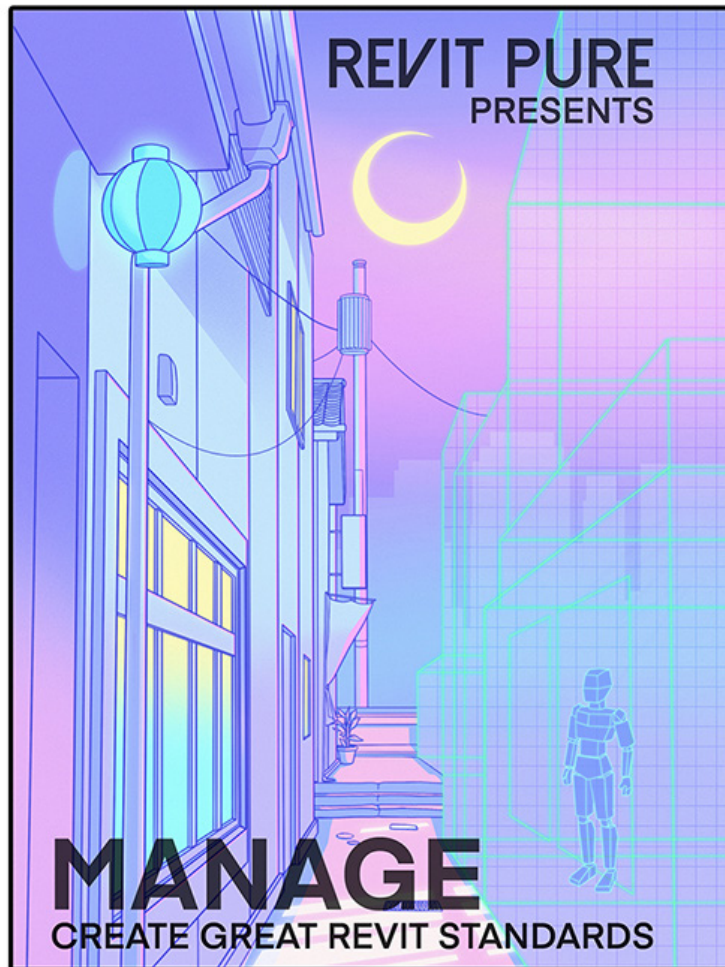


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MANAGE LEARNING PACKAGE

We've recently released a new course dedicated to BIM managers who want to become Revit masters. [Click on this link](#) to get the entire course. Enter code **learn** to get 15% off.





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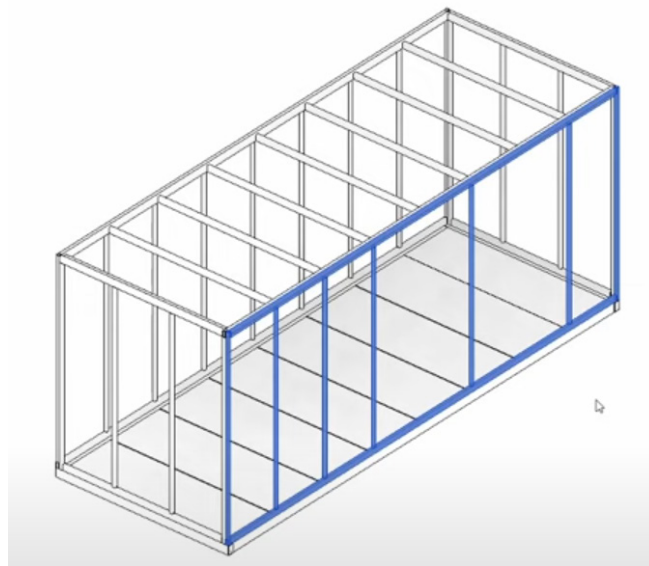
GROUPS VS NESTED FAMILIES VS LINKS VS ASSEMBLY

You can use other Revit tools in a similar way to Groups. Let's explore groups, nested families, links and assemblies. You will learn about their differences and which option is the best.

WHEN TO USE ASSEMBLIES?

Typically, you can use assemblies for structural components. They allow you to automatically create views for a specific "assembly" of elements like beams.

Assemblies aren't made for repeating interior layouts. However, they can be helpful for the structure part of a modular design.





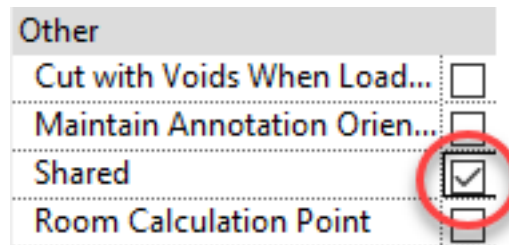
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WHEN TO USE NESTED FAMILIES?

Nested families are amazing! More people should use them. The main idea is simple: families inside of families. For example, a “living room” furniture nested family could include a couch, a rug and a table.

Each “nested” family inside the main family should be shared. It means you can both use the family inside the main family, but also independently. Make sure to check the Shared parameter inside the family.

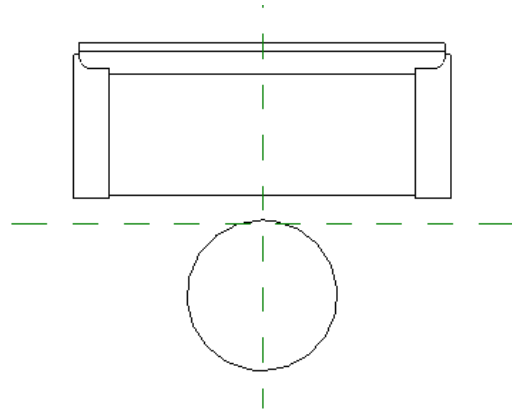


As you can see in the image next page, we have a nested family that contains a couch and a table. Since these families are shared, they can also be loaded individually in the project. Furthermore, they can be used inside this shared family or as a separate, unique family.

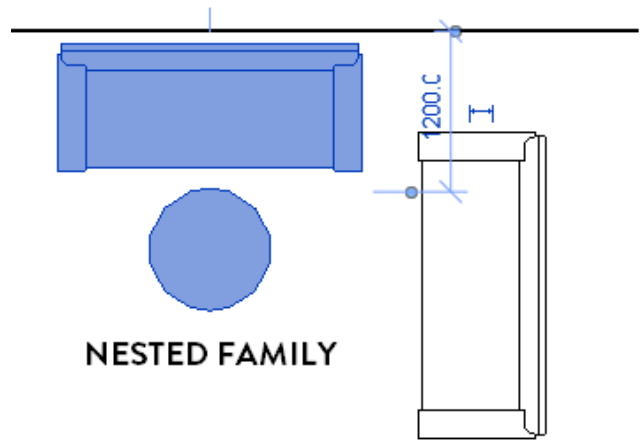


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**NESTED FAMILY WITH TABLE + COUCH
SHARED FAMILIES**



NESTED FAMILY

"UNIQUE" FAMILY

Nested families have a significant limitation: they cannot include system families like walls, ceilings, floors, etc.

Nested families are most helpful when multiple loadable families are part of a layout.



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Here is an operating room example:

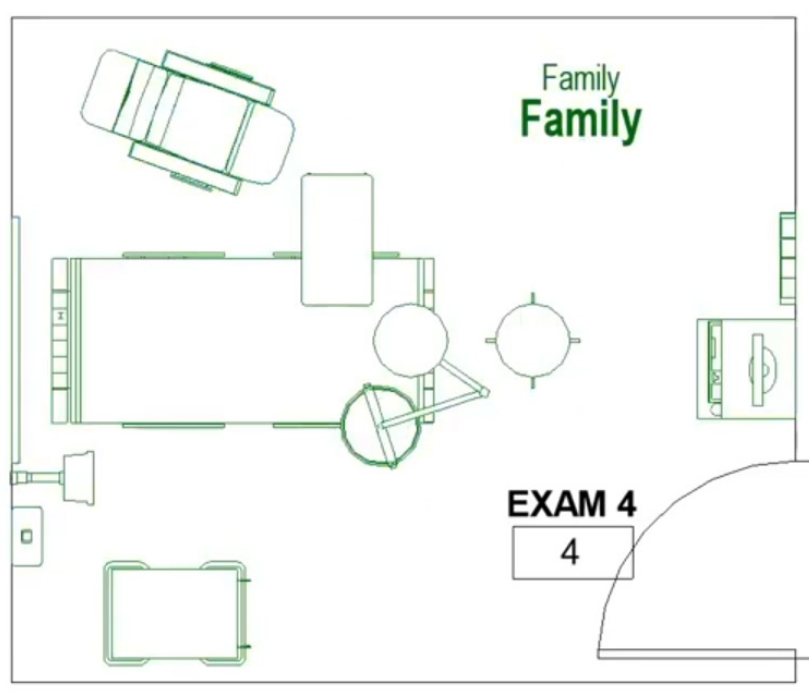


Image credit: Belinda Carr (https://www.youtube.com/watch?v=-iKFClg_Imw)

In this example, everything in green is part of a nested family. If you are curious about the complete list of pros and cons of nested families, have a look at Belinda's video.

WHEN TO USE REVIT LINKS?

Revit links are a big rival to Revit groups. You should probably use Revit Links instead of groups for modeling:

- Different buildings on a site.
- Part of a building done by a specific firm (example: specialty kitchen equipment, interior design team, etc.).



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- Content needs to be used in multiple projects at the same time.

Pros of links:

- No annoying issues (fix groups) and strict rules to follow.
- Multiple people can work on a link at the same time.
- A link can be used on various projects at the same time.
- Links help to create smaller models and ensure better performance.

Cons of links:

- Complicated to tag and dimension.
- No instance parameters for elements.
- Reloading content (wall types, families, etc.) is difficult. You must do it in each linked file.
- Forced to open a separate instance of Revit to work on the link.

Pros of Groups:

- You can assign unique instance parameters to elements
- Easier and faster to edit.
- Easier to reload families and content.
- Possible to attach “nested detail group.”



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Cons of Groups:

- Only one user can work in a group at the same time.
- Common group issues (groupception, “fix groups,” hosted families, excluded bugs, warnings, by face families’ issues, etc.).
- Porosity of groups: can interact with surrounding elements.
- Heavier Revit models require more RAM.
- Groups cannot be live-shared by multiple Revit models.

In the context of an interior layout (apartment, patient room, modular apartment), groups are the winner. But it might depend on your context and workflows. It is possible to convert a Revit group to a link and vice-versa.

SCHEDULING GROUPS: THE BASICS

It is possible to schedule Model Groups. The group itself is scheduled, not the elements contained inside.

In the old versions of Revit, you only have four schedulable parameters by default. Revit 2023 added all the common parameters (description, comments, etc.).

It is possible to add project parameters to model groups in any Revit version.



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Category:
 MEP Fabrication Pipework
Model Groups
 Nurse Call Devices
 Parking
 Data

Name:
 Model Groups Schedule

Schedule building components
 Schedule keys

Available fields: 4 items

- Count
- Origin Level Offset
- Reference Level
- Type

Available fields: 26 items

- Assembly Code
- Assembly Description
- Comments
- Cost
- Count
- Description

REVIT 2022

REVIT 2023

By default, model groups schedules won't tell you much. They can be use to display the count and reference level.

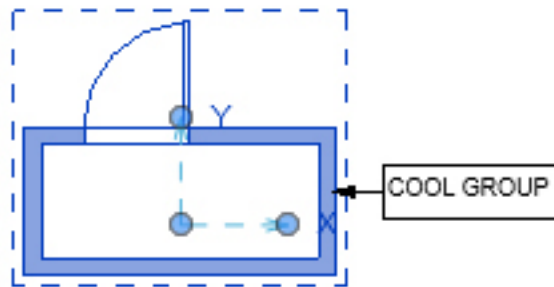
<Model Groups Schedule>	
A	B
LEVEL	COUNT
APP-A	
LEVEL 1	1
LEVEL 2	1
APP-B	
LEVEL 1	4
LEVEL 2	1
APP-C	
LEVEL 1	2



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With Revit 2023, it is also now possible to tag model groups.



AUTOMATING GROUPS WITH DYNAMO

What if you want to schedule everything inside of a group? Revit won't let you do it by default. However, using Dynamo can make it work for you. Let's explore the steps to create a group numbering script.

Step 1: Add "Group Type" and "Group Instance" Shared Parameters

Create new shared parameters to everything that will be included inside of groups that you may want to schedule (walls, doors, rooms, etc). Also, add these parameters to the Model Group category as well. Notice that when you add a project parameter, you have the option to use "Values can vary by group instance." That means each instance of elements can have a different value for this parameter. For Dynamo to properly work, you need to use this option for all parameters you add.



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Parameter Data

Name:

Discipline:

Type of Parameter:

Group parameter under:

Tooltip Description:

Type

Instance

Values are aligned per group type

Values can vary by group instance

All elements inside your group should have these two parameters when selected. Since you've picked the "Values can vary by group instance" option, you can modify the value directly by tab-selecting the element. No need to enter the group first.

Basic Wall
RP_Int Metal Stud 124mm

Walls (1)

Constraints

Cross-Section Definition

Text

Group Type

Group Instance

However, you can't modify these parameters manually. You need the help of Dynamo.

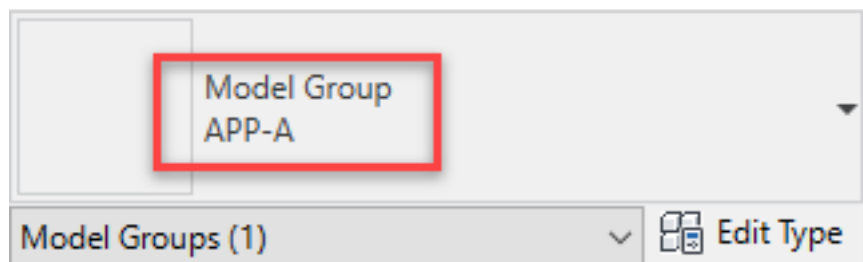


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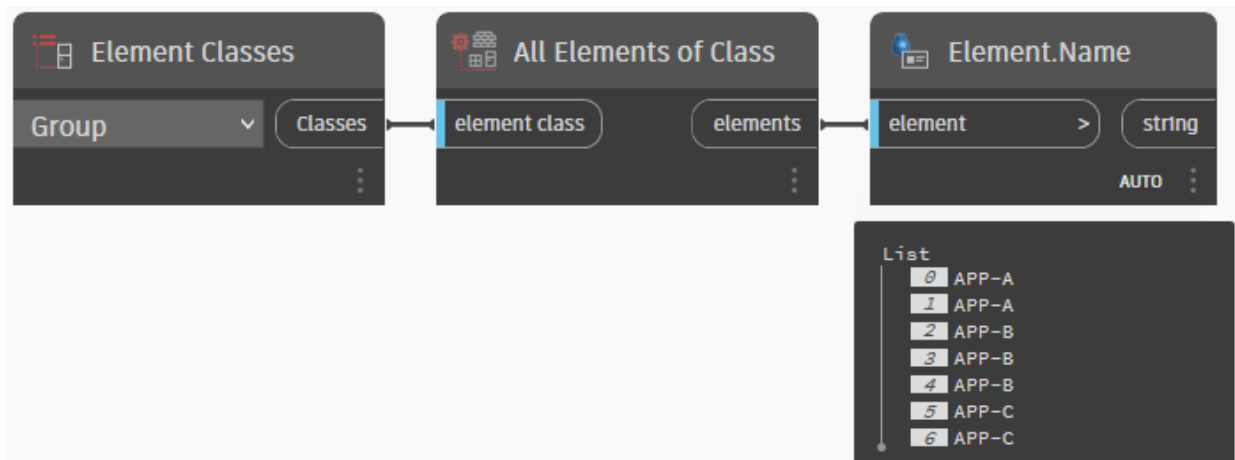
Step 2: Set a Numbering System for your Model Groups

The group type name will serve as the primary way of numbering and marking individual elements. Therefore, make sure to have a clear name representing the group usage. For example, APP-A (For apartment type A), MODULE-01, etc.



Step 3: Start Dynamo Script, add Custom Packages

Open Dynamo. You will need to install the Clockwork package. Then, create nodes to extract the type names of all placed groups. You will need the Element Classes, All Elements of Class and Element.Name nodes. These nodes are used in Dynamo 2.13. If you are using older versions of Dynamo, the nodes might be called "Element Types" and "All elements of Types."

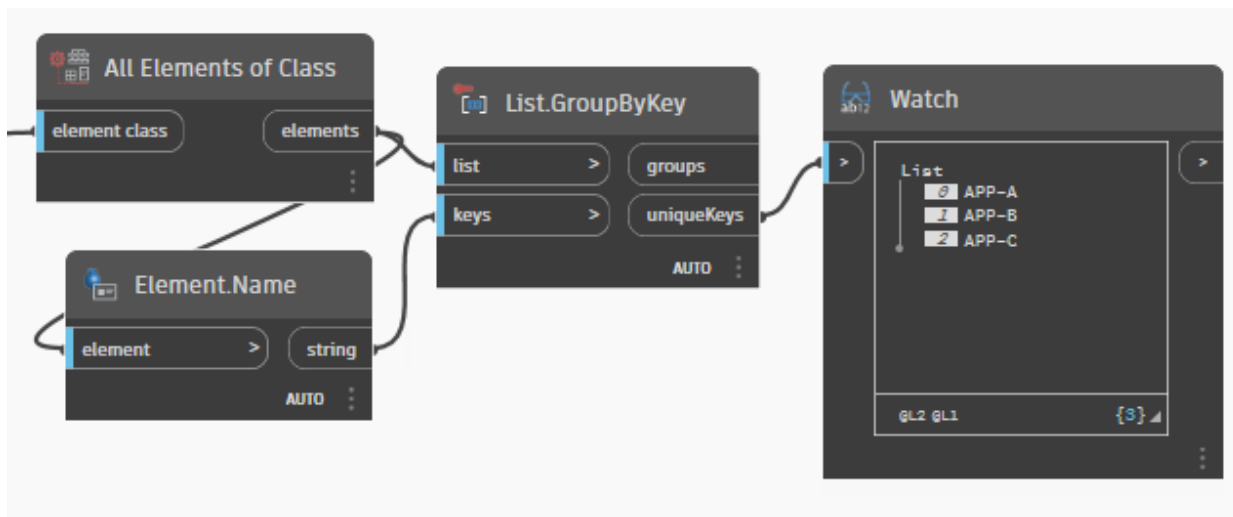




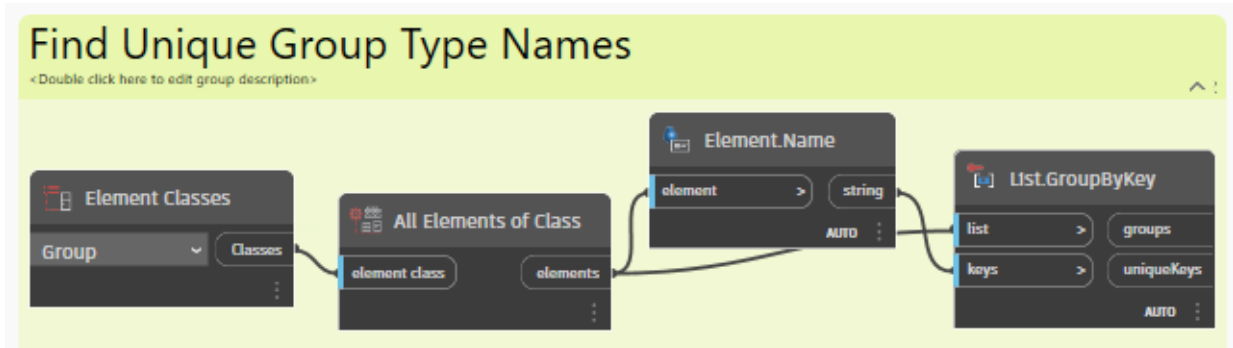
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Here, you might consider filtering the groups to only keep specific ones, for example, those whose name starts with "APP." Then, you need to extract unique group type name values. Bring the node called list.GroupByKey. It creates a list of the different group names used in the project.



It is a good idea to group these first four nodes.





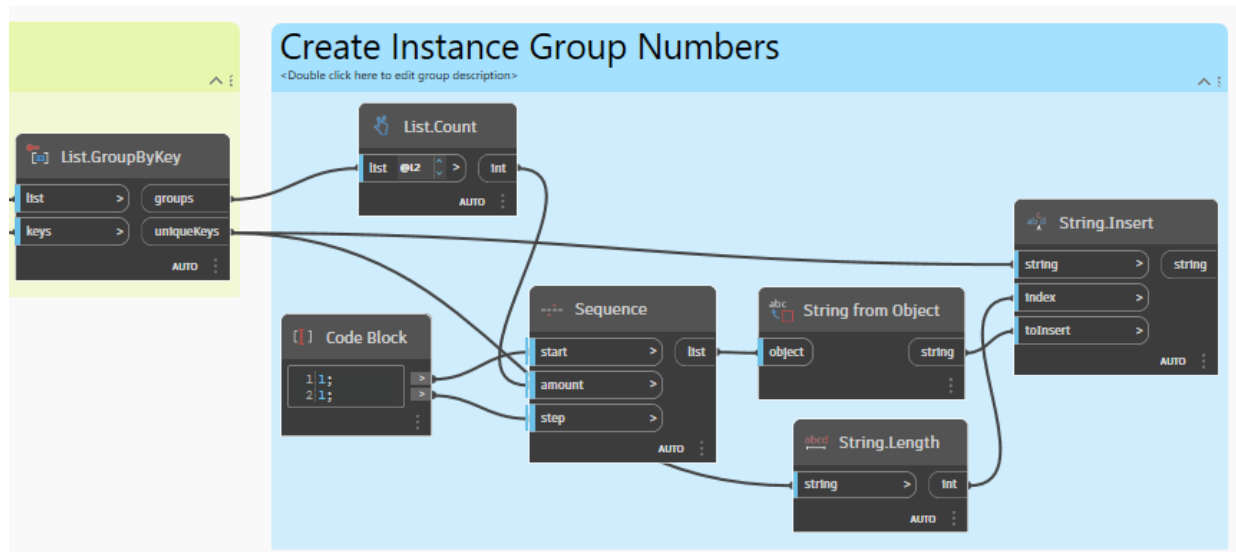
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Step 4: Create Unique Number For Each Group Instance

Now, you want a unique number for each group instance. For example, if there are three instances of the APP-A group, they will be called APP-A-1, APP-A-2 and APP-A-3. You could customize this name even further by adding the level. However, we'll stick to a simple number for the moment.

You want the script to: Take the group type name, append a number at the end and assign it to the new shared parameter you've created for all group instances. For this, we will use the Sequence node. Use the List.Count node to set the correct amount of numbers for each group type. Convert the sequence to a String. It is possible to add a separator (such as -) to the number. Then, use the string.Insert node to add the number and separator to the original string extracted from the "uniqueKeys" output.

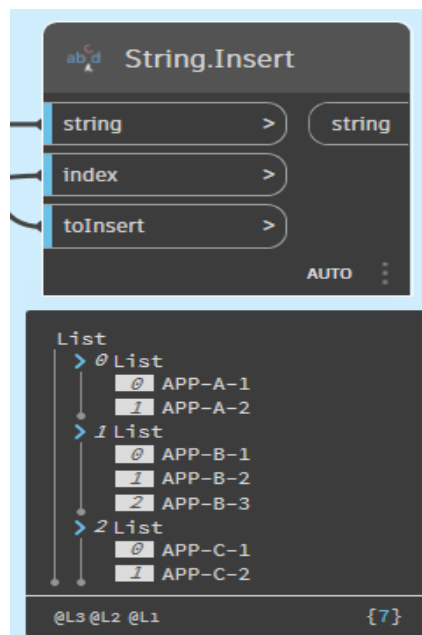




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You can see the number sequence you should get in the image below. There are two instances of the group type called "APP-A". Therefore, the script creates two strings, called "APP-A-1" and "APP-A-2". Unique numbers will also be generated for every other group type.



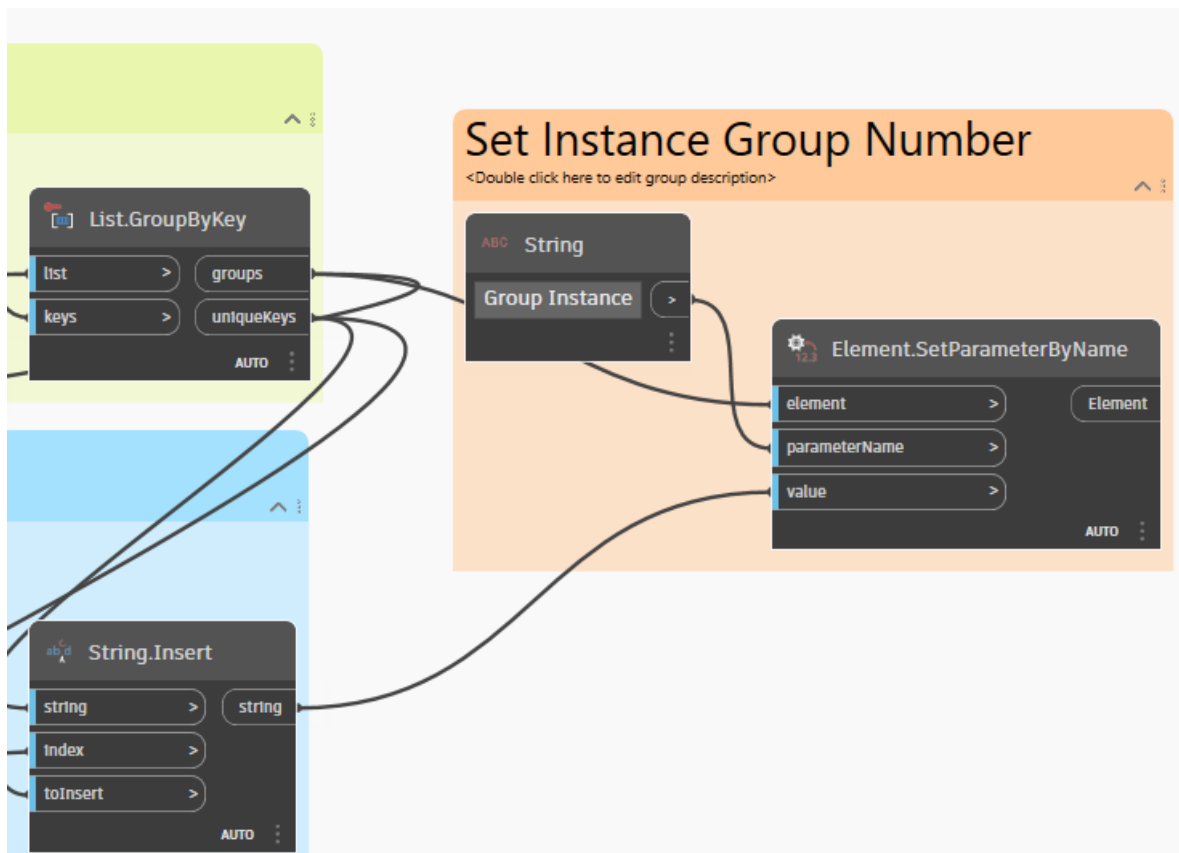


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Step 5: Attribute Unique Mark to Each Group Instance

Now, let's add these strings to the Group Instance parameter of each model group. Bring in the node called "Element.SetParameterByName". Use the "Group Instance" parameter name you've previously created. Bring in the final string for the value.

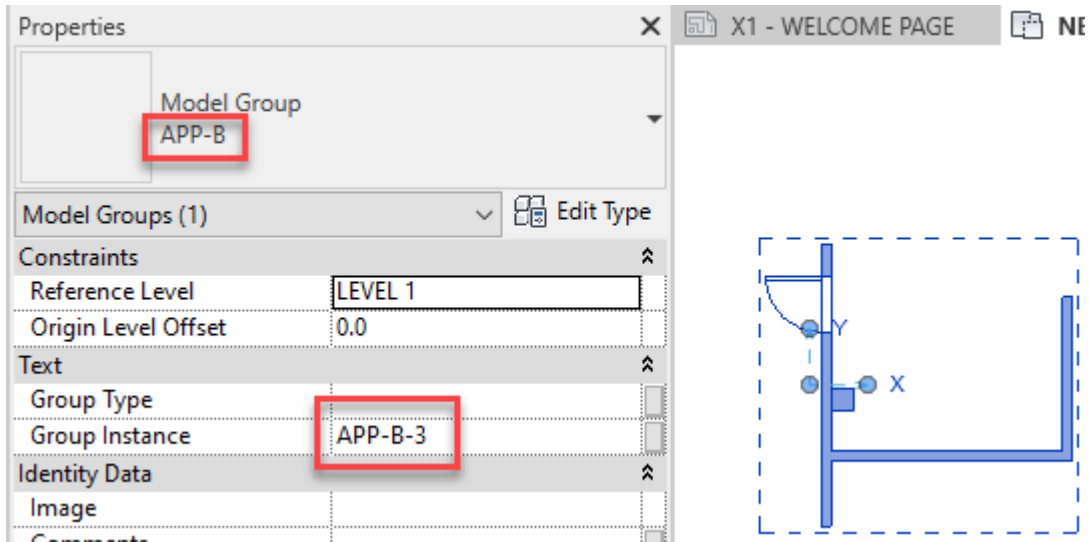


As you can see, each group instance should now have a unique number in the Group Instance parameter you've created. The sequence will be based on the order of creation. For example, group APP-B-3 will be the third instance created of this group type.



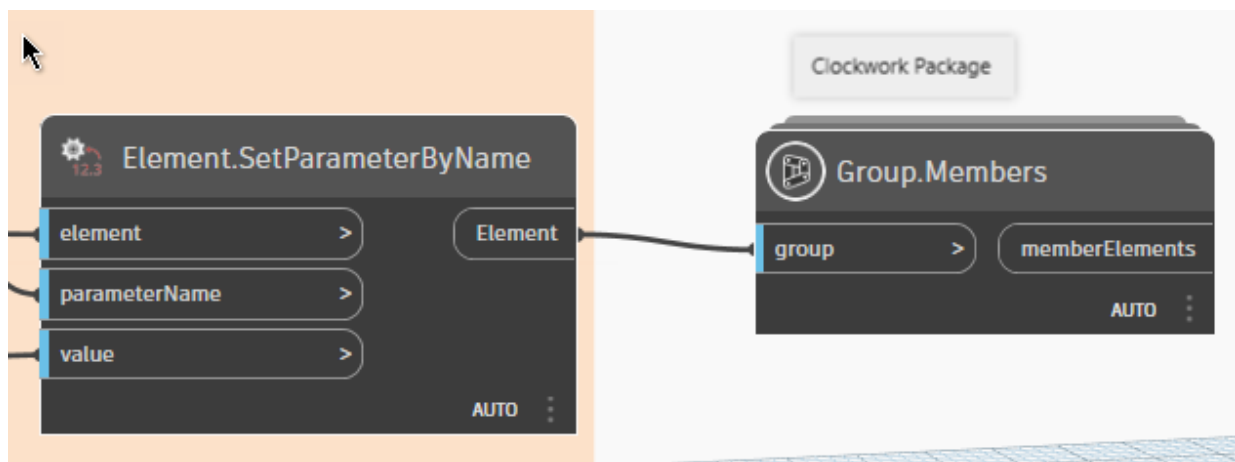
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Step 6: Assign Type & Instance numbers to elements part of the group

Now, we will pick everything contained inside the groups and assign the type and instance numbers. You will need to install the Clockwork package and DynamolIronPython. Bring in the Group Members node from Clockwork.

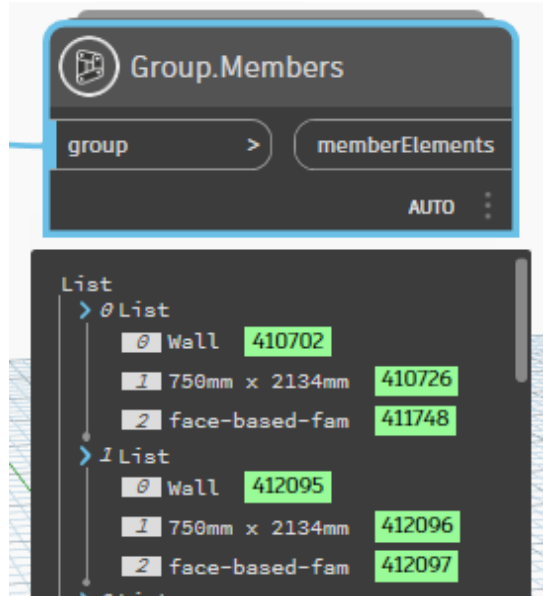




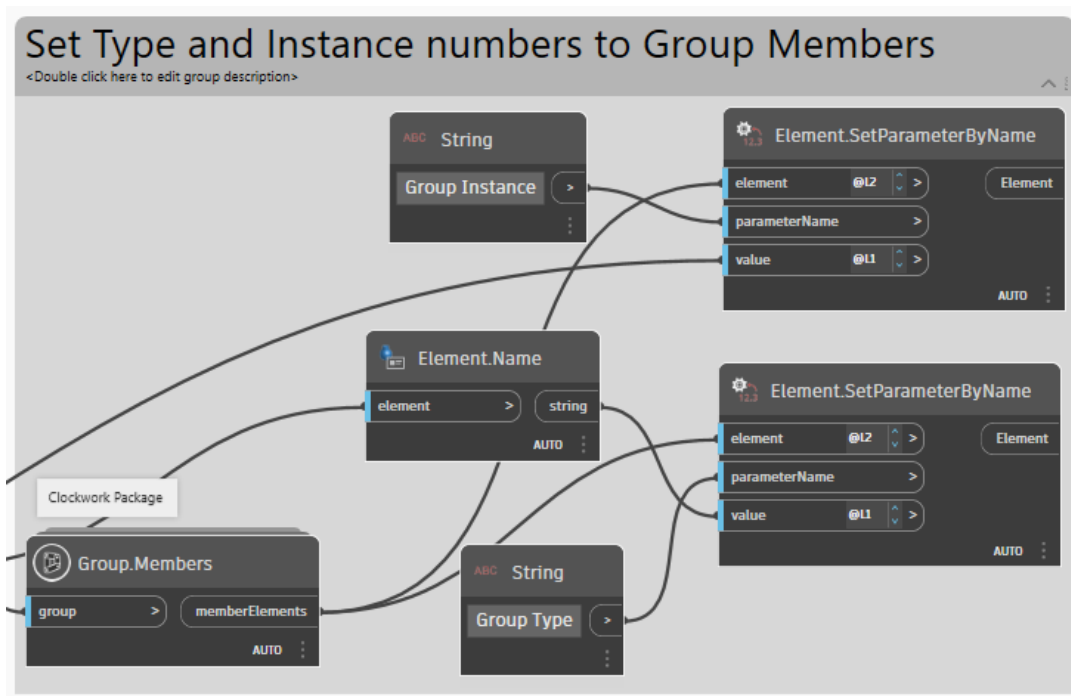
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This node will list everything contained inside of each group:



Use these nodes to set the type and instance parameters to the elements:

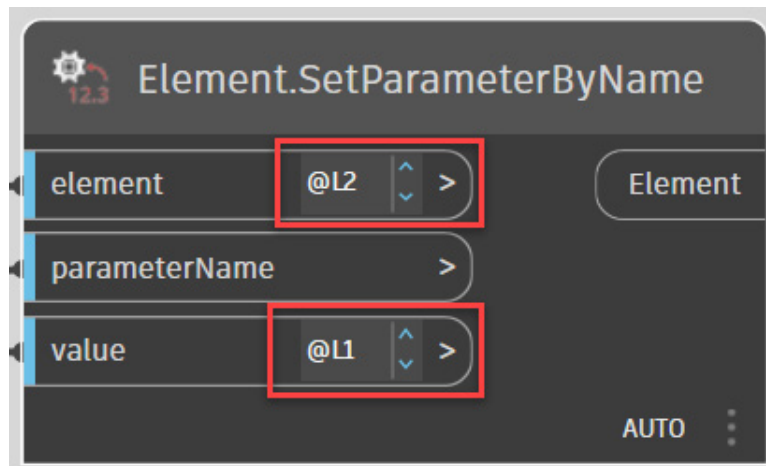




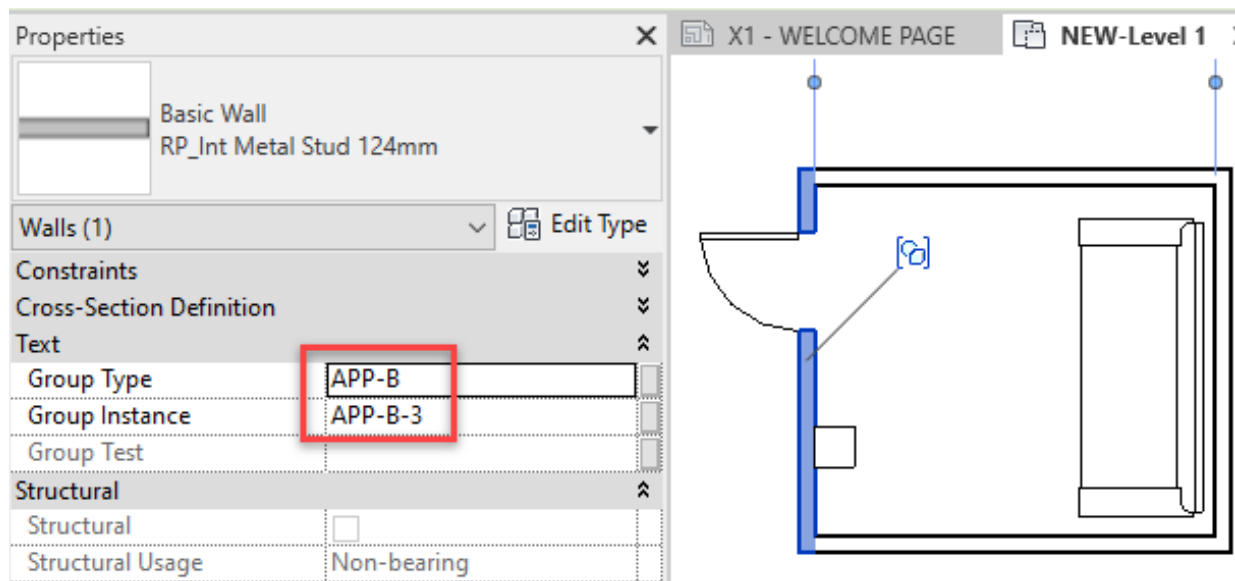
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Have a close look at the levels of the list. Set “element” to @L2 and “value” to @L1.



Tab-select one of the elements in the group. You should see both the type and instance numbers:



Important: each time you modify the groups, you’ll need to rerun the Dynamo script.

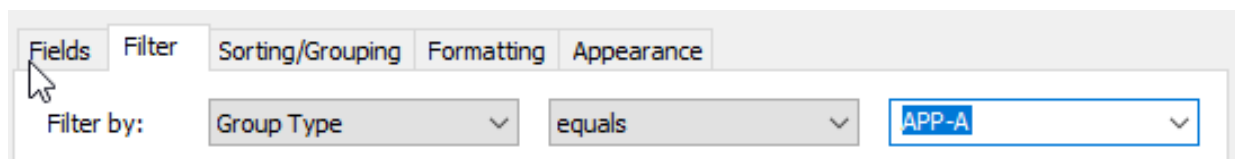


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SCHEDULING MULTI-CATEGORY GROUPS

The Dynamo script marked each element inside groups, ensuring more options in scheduling. Let's try to create a multi-category schedule. In the Filter, let's only keep apartment A.



Here is an example that includes everything from the App-A group type.

<APP-A-GROUP>		
A	B	C
Category	Family and Type	Count
Doors	RP_DOOR_Simple: 750mm x 2134mm	2
Generic Models	face-based-fam: face-based-fam	2
Walls	Basic Wall: RP_Int Metal Stud 124mm	2

You could also have a schedule that includes all groups, sorted by instance number.



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<APP-A-GROUP>

A	B	C
Category	Family and Type	Count
APP-A-1		
Doors	RP_DOOR_Simple: 750mm x 2134mm	1
Generic Models	face-based-fam: face-based-fam	1
Walls	Basic Wall: RP_Int Metal Stud 124mm	1
APP-A-2		
Doors	RP_DOOR_Simple: 750mm x 2134mm	1
Generic Models	face-based-fam: face-based-fam	1
Walls	Basic Wall: RP_Int Metal Stud 124mm	1
APP-B-1		
Doors	RP_DOOR_Simple: 750mm x 2134mm	1
Furniture	Couch-Viper: Couch	1
Generic Models	face-based-fam: face-based-fam	1
Walls	Basic Wall: RP_Int Metal Stud 124mm	4

Here is an example of a door schedule that includes the group instance.

<DOOR SCHEDULE>							
A	B	C	D	E	F	G	H
NO.	ROOM		DOOR			GROUP INSTANCE	
	FROM R	TO ROO	TYPE	HEIGHT	WIDTH		MATERIAL
LEVEL 1							
104			P2	2134	750		APP-A-1
109			P2	2134	750		APP-B-1
112			P2	2134	750		APP-B-2
113			P2	2134	750		APP-B-3

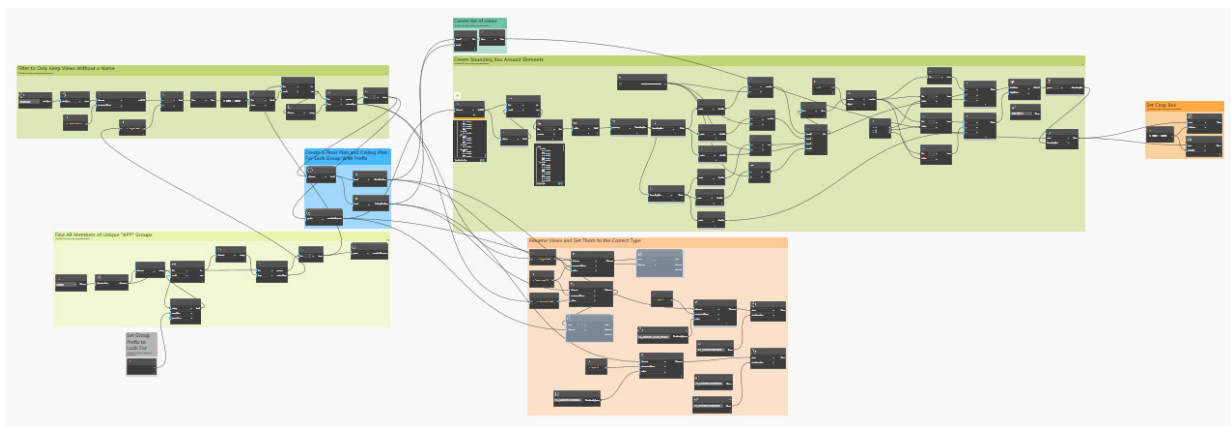


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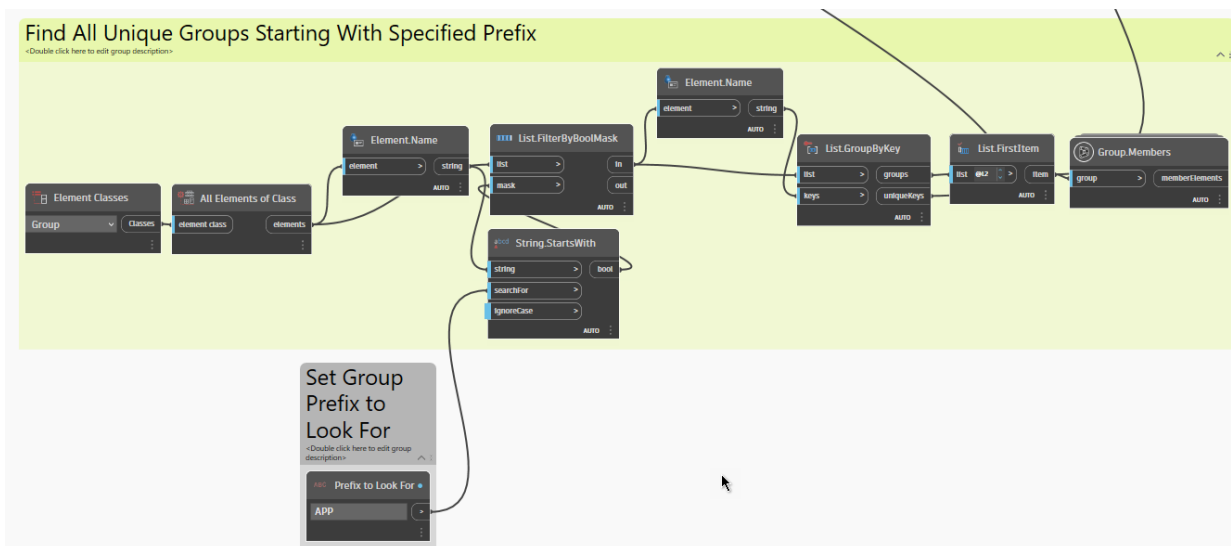
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DYNAMO BONUS: CREATE VIEWS FOR EACH GROUP

If you have lots of groups, Dynamo can be used to generate views quickly. The script is a little heavier, though. It works in Dynamo 2.13 (Revit 2023). You need 3 packages: Clockwork, Rhythm and Archilab. Here it is:



The first step is to create nodes to find all unique groups starting with a specified prefix. For example, the script gets all groups with the “APP” prefix.





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Then, the script verifies if there are already views for these groups. If so, these groups are filtered out.



The script then creates a plan view and ceiling plan for each filtered group.

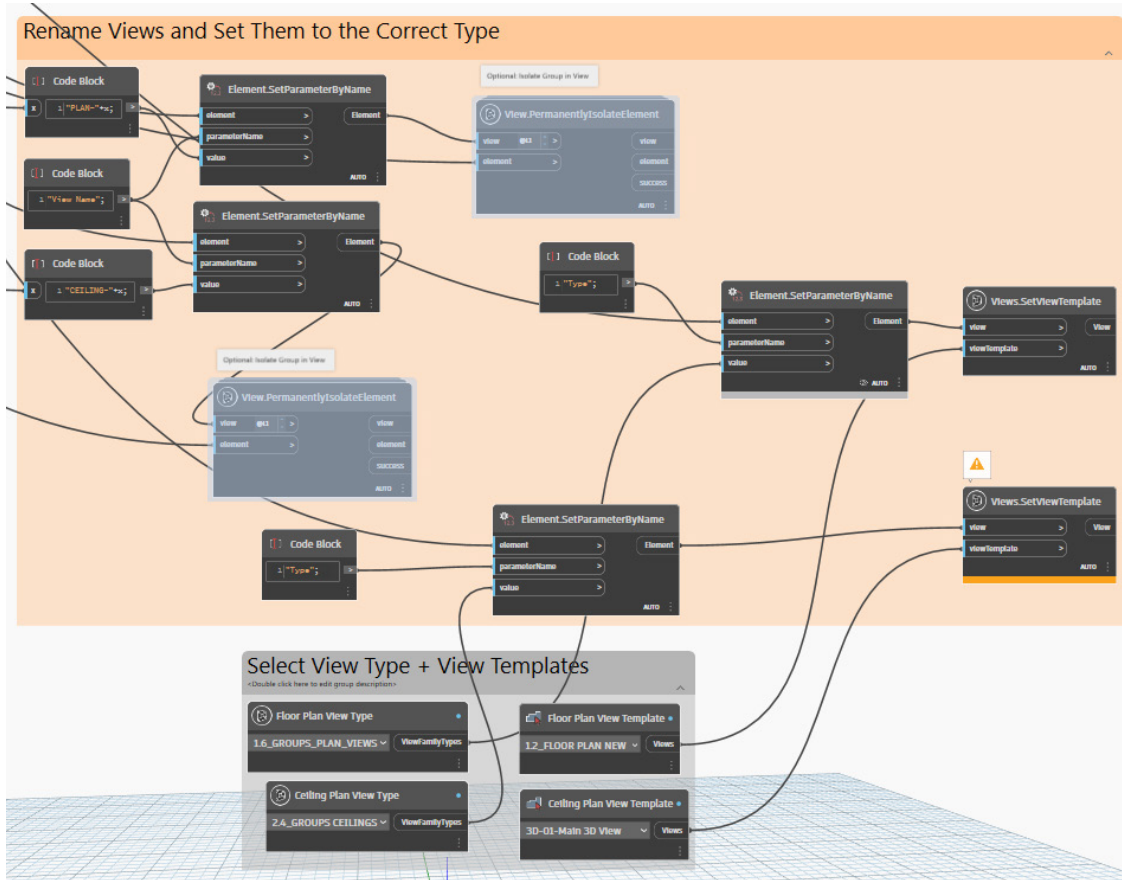


The script then renames the views to match the group name. They are also moved to a user-specified group type and assigned to a view template.



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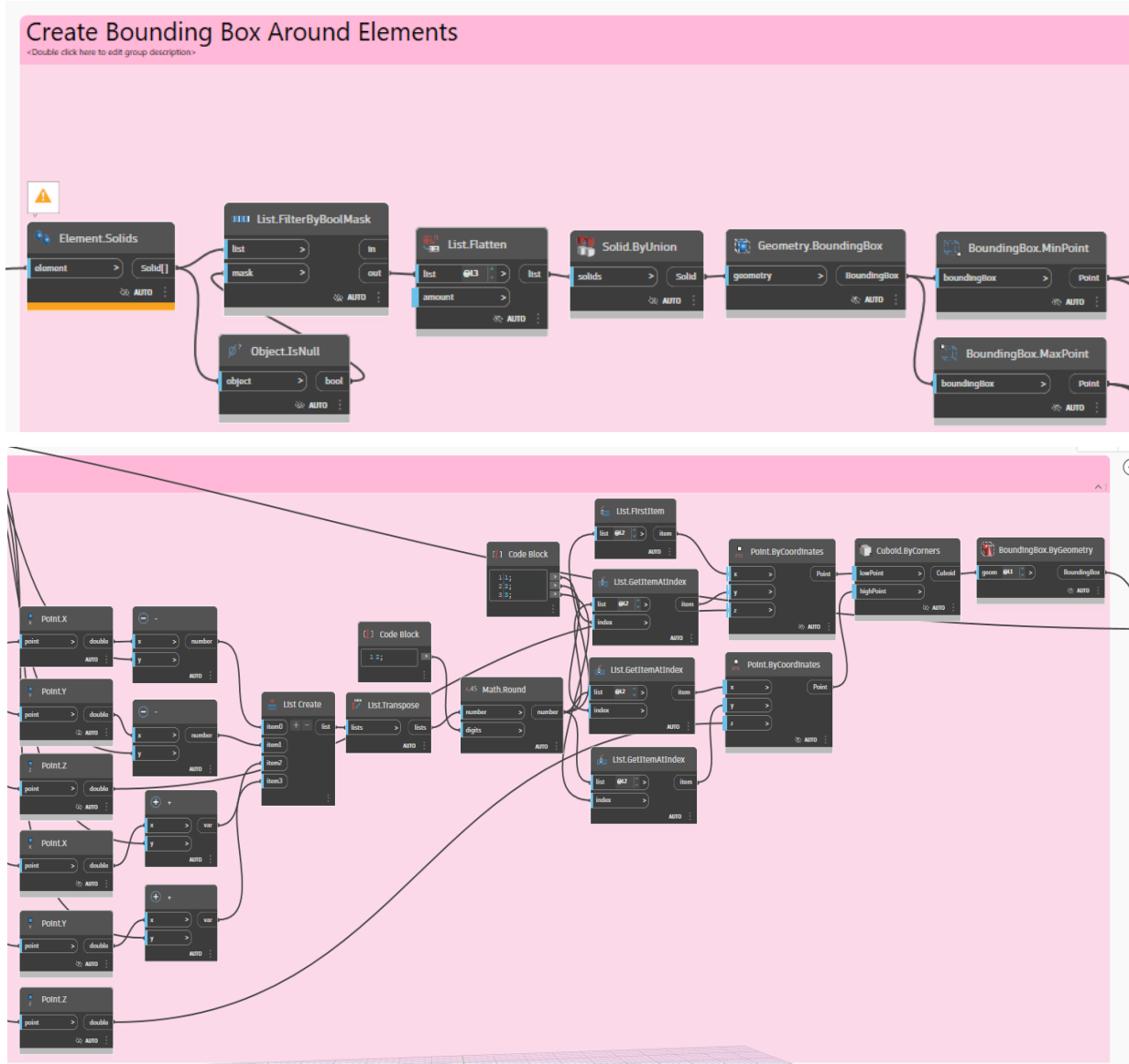


Then, you need to create a bounding box around all elements in the group. Extract the “min point” and “max point”. Then, set to a user-specified offset value to leave a gap between the group and the crop region.



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Finally, the script assigns the bounding box to the crop region of the views. The crop box nodes are new from Dynamo 2.13. In older versions, you'll have to use other techniques with custom packages (like MEPOver). A limitation of this script is that if a group is rotated, the crop region won't have a rotation.

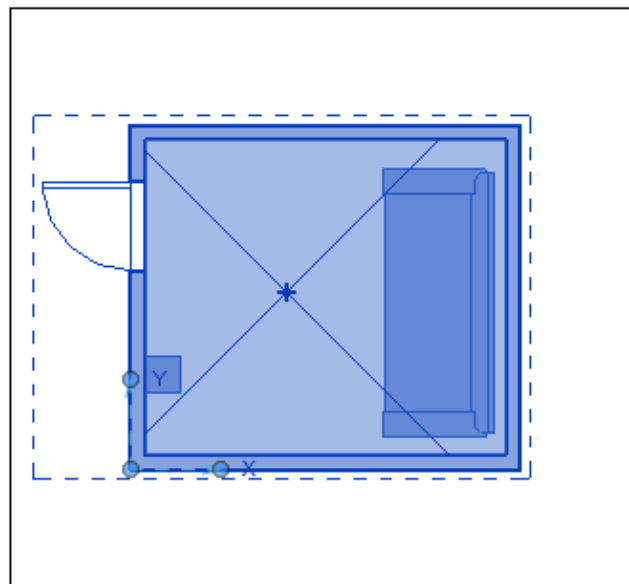
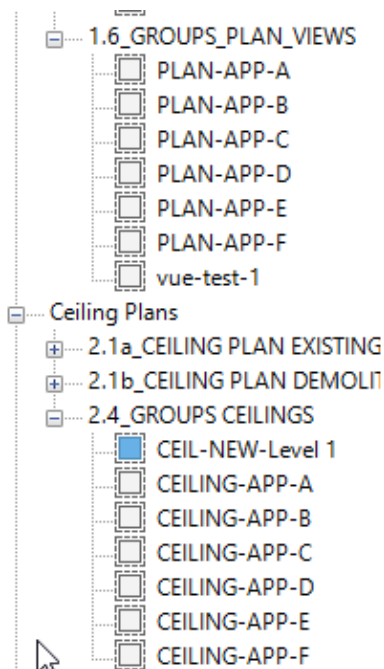


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Have a look at your project browser. There are views for all groups! On a project with many apartments and modules, this can save a lot of time. In addition to plan and ceiling views, you could add elevations, 3D views and other view types.





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CONCLUSION

Groups are great for multi-apartments buildings and modular construction. Make sure to understand the best practices the avoid damaging issues. Use the power of Dynamo and schedules to make the most of your group's data.



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REFERENCES

Niall Kelly – 8020 BIM – “Revit Groups are Awesome! How to Make and Edit Revit Groups”

<https://www.youtube.com/watch?v=-OfkWekWf2I>

Niall Kelly – 8020 BIM – “22 Tips for Mastering Revit Groups”

<https://www.youtube.com/watch?v=rRpoDSg5dPE>

Aaron Maller & Jeffrey Pinheiro – TheRevitKid – “Revit Groups vs Links”

<https://www.youtube.com/watch?v=yKW1tdyZ8lk>

Nivin Nabeel – CanBIM (Building Transformations) – “Big Team, Big Project, No Time”

<https://www.youtube.com/watch?v=l76M5c0S7fE>

Belinda Carr – “Groups vs Nested Families”

https://www.youtube.com/watch?v=-iKFCIlg_lmw

Tim Waldock – “Revit Mirror Command is so not BIM”

<http://revitcat.blogspot.com/2021/11/revit-mirror-command-is-so-not-bim.html>

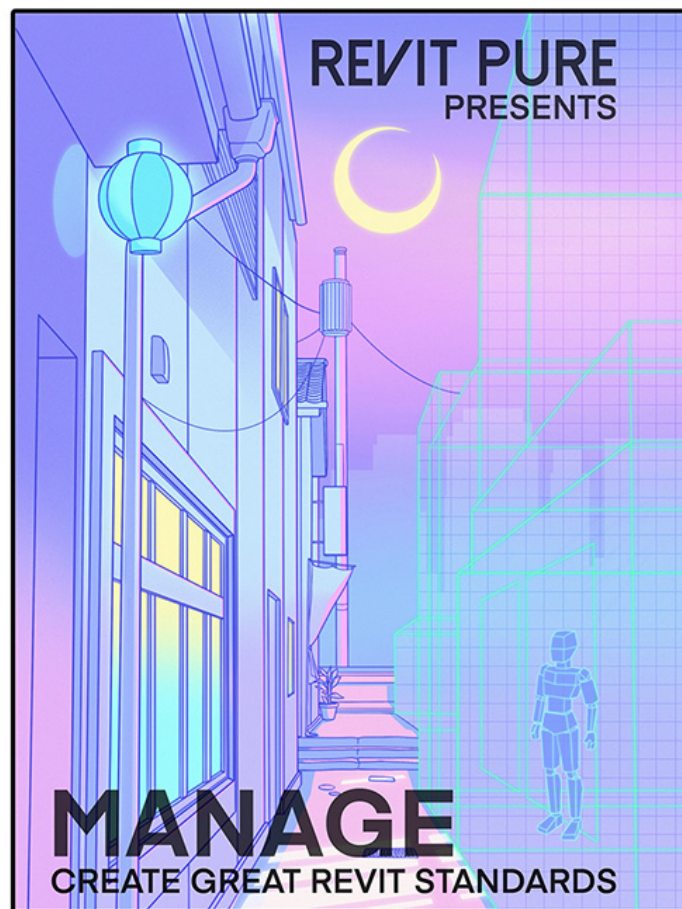


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CHECK OUT OUR MANAGE COURSE

Did you enjoy this pamphlet? Make sure to check out our MANAGE learning package, which will help you create great standards and keep healthy Revit models. [Click here](#) to learn more about the MANAGE course.





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THANKS FOR READING!

As always, send your thoughts to nick@revitpure.com. I read and answer all emails. Let me know what theme you want explored for the next edition.